

ART. V—*An Australian Record of the Foraminiferal Genus Hantkenina.*

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The foraminiferal genus *Hantkenina* has not hitherto been recorded from Australia and, in view of its proved value as an index fossil in other parts of the world, its discovery in the Cape Otway district of Victoria in deposits, the age of which has been uncertain, is of special importance.

The presence of *Hantkenina* in the Tertiary of Australia was first recognized in December, 1944, when the writer found portion of a test in a sample of glauconitic clay from the Brown's Creek coastal section, 8½ miles north-west of Cape Otway. This material had been collected by Dr. F. A. Singleton, of the Geology Department of the University of Melbourne, during the course of field work upon which he has been engaged in the district over a number of years. Subsequently, the writer, in company with Dr. Singleton and his sons, Messrs. O. P. and P. D. Singleton, visited the area and collected material from which more than 30 examples of *Hantkenina* have been obtained. Eight of these specimens were from the Brown's Creek locality and the remainder are from Hamilton Creek, about 6 miles east of Brown's Creek. The specimens have most of their delicate spines intact and are not infilled, their state of preservation being so perfect that there can be no doubt as to their being indigenous to the deposit in which they were found.

Seven of the specimens from Brown's Creek are from a highly-glauconitic bed containing numerous examples of the pelecypod *Notostrea*. This rests on the glauconitic clay from which Dr. Singleton's specimen was obtained. An additional example was obtained by the writer from the clay. The specimens from Hamilton Creek are all from the most southerly exposure of Tertiary on the creek, where it occurs in the west bank, about 400 yards north of the Great Ocean-road. With one exception, the examples of *Hantkenina* from this locality are from the glauconitic clay which, as at Brown's Creek, underlies a highly-glauconitic bed with abundant *Notostrea*. The other specimen is from the *Notostrea* bed. The glauconitic clay is the lowest fossiliferous bed exposed at each locality, the underlying beds at Brown's Creek being covered by dune sand and those at Hamilton Creek being below the level of the creek.

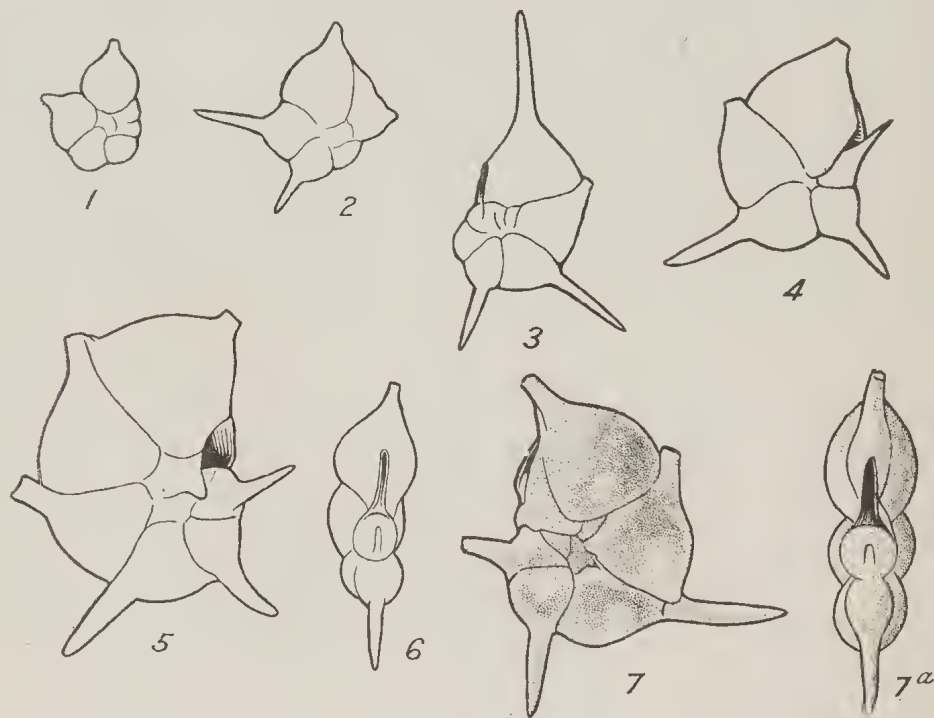
The foraminifera associated with *Hantkenina* at both localities are almost wholly perforate calcareous species, very many of which are undescribed. Those at Hamilton Creek include species of *Spiroplectammina*, *Lenticulina*, *Dentalina*, *Nodosaria*, *Vaginulina*, *Lagena*, *Fissurina*, *Entosolenia*, *Ellipsolagena*, *Guttulina*, *Globulina*, *Glandulina*, *Signomorphina*, *Gümbelina*, *Bulimina*, *Bolivina*, *Angulogerina*, *Cassidulina*, *Ellipsonodosaria*, *Ellipsoidina*, *Spirillina*, *Heronallenia*, *Alabamina*, *Eponides*, *Gyroidina*, *Notorotalia*, *Ceratobulimina*, *Robertina*, *Epistomina*, *Anomalina*, *Cibicides*, *Chilostomella*, *Pullenia*, *Sphaeroidina*, *Globigerina*, *Nonionella*, and *Astrononion*. At Brown's Creek all of these genera, with the exception of *Entosolenia*, *Ellipsolagena*, *Ellipsoidina*, *Notorotalia*, and *Sphaeroidina*, also occur, in addition to *Textularia*, *Dorothia*, *Quinqueloculina*, *Spiroloculina*, *Pyrgo*,

Ramulina, *Virgulina*, *Uvigerina*, and *Discorbis*. The Eocene form described by Cole (1927, p. 22, pl. 5, fig. 12) under the name of *Nonion micrus* is also common at both localities. The foraminifera enable the *Hantkenina*-bearing beds at Brown's Creek to be correlated with those at Hamilton Creek, a conclusion which Dr. Singleton has reached on other evidence.

The form of *Hantkenina* represented at Hamilton Creek and Brown's Creek is closely related to *H. alabamensis* Cushman, from the Upper Eocene of U.S.A. It may be described as follows:—

HANTKENINA ALABAMENSIS Cushman, sub-species *compressa*, nov.

Test planospiral, compressed, adult whorl with five or six moderately inflated chambers, each as long as broad, furnished with a long hollow peripheral spine which is situated at the front end of the chamber and directed forward; wall finely punctate, surface granulated on the early chambers, later smooth; aperture in the centre of the face of the last-formed chamber, an elongate comparatively narrow opening widening at the lower end, which is extended forward on each side as a narrow flange.



Hantkenina alabamensis Cushman, sub-species *compressa*, nov., Figs. 1-6. Hamilton Creek. Figs. 7, 7a. Side and apertural views of holotype, Brown's Creek. All figures X 60.

Dimensions of holotype.—Diameter with spines, 1 mm.; without spines, 0.6 mm.; thickness, 0.2 mm.

Holotype from Brown's Creek, collected by the writer.

This form differs from previously described *Hantkeninae* in the considerably greater compression of the test and in the shape of the aperture. Occasional examples of *H. alabamensis* showing similar characters are found in material from U.S.A. in which *H. alabamensis* is common, but they are not typical of the species as it occurs there. Figures are given to show the range of variation in the Victorian form. It will be noted that some of the

specimens in the early stages resemble *H. mexicana* and *H. longispina* in having the outer end of the chamber drawn out and terminating in a centrally-placed radial spine. These two species are not known to occur above the lower half of the Bartonian.

The species of the *H. alabamensis* group range through the Upper Eocene (Bartonian) and there are records of the occurrence of several from the Lower Oligocene (Lattorfian). These are by Howe (1928, p. 13) from U.S.A., Rey (1938) from Morocco, and Finlay and Marwick (1940, p. 93) from New Zealand. In view of this, the beds in Victoria in which *Hantkenina* has been found are either Upper Eocene or Lower Oligocene in age. The presence of specimens of the Victorian form showing in the early stages some of the characters of *H. mexicana* and *H. longispina* suggests that it is of a rather more primitive type than *H. alabamensis*. With this in mind and having regard to the fact that the majority of the records of the *H. alabamensis* group are from the Upper Eocene, it appears probable that the beds from which the Victoria specimens were obtained are Upper Eocene in age.

The writer is indebted to Dr. Singleton for making available the material which led to the discovery of *Hantkenina* in the Tertiary of Victoria. He also thanks Dr. M. F. Glaessner for his advice and helpful criticism in the preparation of this note.

The holotype and other figured specimens will be deposited in the collection of the Geology Department of the University of Melbourne.

References

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